

VENTED PACKAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The invention relates to a vented package, and more particularly to a cotton bale cover having a configuration to vent air when loading cotton therein.

2. Background of the Related Art

[0002] A wide variety of packaging materials are available for packaging cotton. Typically, such packaging includes bale covers that are made from woven fabrics such as coarse jute yarn or woven polyolefin fabrics.

[0003] Woven jute yarn is deficient as a fabric in a bale cover since it permits the entry of dirt, solids and moisture. Jute covers are susceptible to unraveling and as a result, damaged or broken strands of jute may contaminate the cotton. Due to the fuzzy texture of jute, such strands of jute are difficult to remove from cotton contained therein. Moreover, jute covers are prone to tears, rips, and holes that expose the contained cotton to contamination.

[0004] Woven polyolefin fabrics are widely used in the production of bags and cotton bale covers, and provide greater strength than jute covers. Fabrication of polyolefin covers is rather simple and such covers may comprise spiral sewn tubes, flat sheeted bags including a single seam, and circular woven tubes without an identifiable seam. The polyolefin fabric may be coated with strips of thermoplastic resin fused thereto or fully coated along at least the interior or exterior surfaces thereof with a polymer.

[0005] A disadvantage to coated polyolefin covers is that they do not breathe very well, especially when material is loaded therein. One problem is that the thrust of air formed when loading cotton into the

covers is exerted against the walls thereof, and consequently, this may chiefly blow the cover away from the cotton being loaded therein, or to a lesser extent lead the cover to rip, tear or fibrillate.

[0006] An attempt has been made to provide coated polyolefin covers with a plurality of crescent shape openings to exhaust air during loading of cotton therein. An inherent problem with the coated polyolefin covers having such openings is that there is no means to close the openings. Thus, these openings serve as a passageway for air and moisture to penetrate the cotton stored by the coated polyolefin covers which may promote contamination, mold and mildew in the cotton.

SUMMARY OF THE INVENTION

[0007] This invention describes a package having a vent configuration suitable for use in cotton packaging or any other suitable material. The vent configuration enables air resulting from the loading of material into the package to escape from the interior thereof, and thus maintain the cover in position during material loading.

[0008] In an aspect of the invention, a package is provided including a pleated tube. The tube defines opposed first and second face panels connected at one end thereof to define an end closure and contiguously interconnected along their longitudinal edges by gusset sides folded longitudinally and extending inwardly relative to the longitudinal edges of the first and second face panels. The pleated tube is provided with a vent configuration located along the gusset sides near the end closure.

[0009] The construction of the package and vent configuration is provided so that as the package is loaded with material, air and moisture can escape from a lower portion of the package. Gradually, however, the vent configuration diminishes in capability since it is progressively enclosed as the gusset bellows out upon the loading of the package, and weight of the loaded material is exerted thereon.

[0010] The package is configured so that in a loaded configuration, portions of the gusset sides are folded diagonally in relation to a common transverse line defined along the end closure. First sections of each face panel extend in opposite directions inwardly towards the common transverse line. Second sections of each face panel extend in the same direction outwardly from the common transverse line to a terminal edge and with gusset portions therebetween. The first sections of the face panels join to define the end closure, and the first and second sections of the face panels constitute an outer bottom panel forming a generally flat bottom for the package.

[0011] The vented configuration of the package is defined within the portions of the gusset sides that are folded diagonally in underlying relation such that they are covered and enclosed by folded portions of the gusset sides when the package is loaded with material.

[0012] In accordance with one embodiment of the vent configuration, the package comprises at least one opening on each gusset side near the end closure. The at least one opening comprises a plurality of openings defined as slits arranged in a preselected pattern.

[0013] These and other aspects of the invention will be more fully described in the following detailed description and the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view of an embodiment of a vented package of the present invention in an expanded configuration loaded with a quantity of material;

[0015] FIG. 2 is an elevational front view of an empty vented package;

[0016] FIG. 3 is an elevational side view of the vented package in FIG. 2;

[0017] FIG. 4 is an elevational side view of the vented package in FIG. 2 partially expanded;

[0018] FIG. 5 is an elevational side view of the vented package in FIG. 2 fully expanded;

[0019] FIG. 6 is a sectional top view of the vented package in an expanded configuration;

[0020] FIG. 7 is a partial sectional top view of an embodiment of the vented package; and

[0021] FIG. 8 is a partial sectional top view of an embodiment of the vented package.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] As shown in the drawings, in which like reference characters refer to like elements, the package 10 is formed from a portion of web or sheet material and generally defines a tube blank. The package 10 includes a first face panel 12 and a second face panel 14 joined together with intermediate gusset sections 16 on opposed sides and interconnecting longitudinal edges of the first and second panels 12, 14. The gusset sections 16 are infolded along a longitudinal line midway between the longitudinal edges of the panels to provide half gusset portions 18, 20 lying flat between the face panels 12, 14.

[0023] The package 10 includes a transverse end closure 22 at one end thereof whereat end portions of the first and second face panels 12, 14 join. The end closure 22 is preferably a stitched folded seam, but may be a seal or any other element that provides closure to one end of the package. At an end opposed to the end closure 22, the package 10 is open to provide access therein. The open end of the package 10 may be sealed or tied in any fashion known to one skilled in the art. For example, the open end may include a top flap that may be loosely tied at the top thereof to complete an enclosure for the package 10. A generally flat bottom 28 of the package 10 may be defined along folded sections of the face panels 12, 14 and the gusset sections 16 when the package is loaded with material, as is shown in FIG. 1.

[0024] Preferably, the package 10 is a woven polyolefin fabric. In FIG. 1 there is shown an embodiment wherein the package comprises a spiral sewn polyolefin tube having spiral seam 24 that extends around the package 10. Preferably the package is a woven polypropylene fabric but may alternately be constructed from a variety of materials including paper, woven textiles or polymers, and polymeric sheets or films. Moreover, the package may be constructed from polymeric fabric panels with at least one seam connecting such panels, a continuous extruded tube of woven polymeric without an identifiable seam, or any other suitable packing configuration known to one skilled in the art.

[0025] Any coating may be added to the fabric of the package to reduce gloss, fibrillation, slippage, or for any other technical reasons. Such coating may comprise polyolefin that is thermal bonded to woven fabric of the package construction to prevent fibrillation. A coating may be provided on an inner or outer surface of the package, or alternatively on both inner and outer surfaces to enhance the suitability and fitness of the package.

[0026] As shown schematically in FIG. 2, the package 10 includes a transverse fold 26 along the end closure 22. The fold 26 is of a dimension generally one half the width of the gusset 18 from a longitudinal edge of one of the face panels 12, 14.

[0027] In FIG. 3 there is illustrated an embodiment of the package 10 including at least one opening 30 near the transverse fold 26 and end closure 22. According to this embodiment, it is necessary that the openings 30 are defined in close proximity to the end closure 22 relative to the entire longitudinal length of the package 10. While the openings 30 are preferably slits that are generally parallel to the gusset 16, the openings may assume a variety of shapes and configurations that sufficiently permit venting of the package 10 as material is loaded therein.

[0028] Prior to loading the package 10 with material, the gusset 16 will generally assume the configuration shown in FIG. 3. The package 10 can be considered to form automatically, as shown by FIGS. 4 and 5. As material which is to be contained by the package 10 is loaded therein, it falls against the transverse end closure 22 and fold 26. Air thrust from the loaded material urges the expansion of the openings 30 so as to vent the package 10 during loading. As more material is loaded into the package 10, the gusset side portions 18, 20 bellow out and space the first and second face panels 12, 14. At the same time, as shown in FIGS. 5 and 6, the gusset side portions 18, 20 near the transverse end closure 22, and folds 26 hinge inwardly to form diagonal underlying gusset portions 32. This automatic formation of the package 10 continues until the package 10 is fully loaded, as shown in FIG. 1, which comprises a prismatic structure having a generally flat bottom 28 comprised of interfolded portions of the face panels 12, 14.

[0029] Of particular note, the openings 30 are clearly defined and positioned within such interfolded portions of the face panels 12, 14 and gussets 16 when the package 10 is filled. Accordingly, the openings 30 are enclosed by the folded interfolded portions of the face panels 12, 14 and gussets 16. As exemplified in FIG. 6, the weight of the loaded material urged downwardly towards the bottom 28 of the package 10 will further prevent exposure of the openings 30, thus preventing entrance or exit of air or moisture through such openings 30 once the package 10 is loaded.

[0030] It will be evident that as the package is loaded, the capability of the openings to extinguish air or moisture progressively diminishes due to the formation of the interfolded portions of the face panels and gussets, and the weight of the material exerted against the bottom of package. Therefore, the package provides means for venting air thrust during material loading but automatically decreases such venting to eventually obstruct venting of the package and thereby prevent any

entrance of air or moisture via such vents when the material is stored and transported in the packages. Thus, there is no requirement for a post production process to close the openings, and loading of the package is therefore greatly facilitated.

[0031] In embodiments of the package exemplified in FIGS. 7 and 8, there are shown different vent configurations. For example, FIG. 7 shows openings 30 defined as a plurality of slits generally at an angle relative to transverse fold 26. Moreover, FIG. 8 shows openings 30 defined as a plurality of circular apertures arranged in a descending order from the lateral periphery of the bottom 28 of the package 10 along the transverse fold 26 towards a center of the package 10. The openings 30 may be provided in a manner generally consistent with the shape of the diagonal underlying gusset portions 32.

[0032] In a preferred embodiment, the vented package of the present invention is intended for use in cotton packaging. Therefore, a preferred embodiment of the package has dimensions generally in compliance with industry standards such as those "2003 Specifications for Cotton Bale Packaging Materials" approved by the Joint Cotton Industry Bale Packaging Committee and incorporated herein by reference.

[0033] The configuration and dimensions of the package of the present invention may vary according to the specific application, government regulations and industry standards for the material to be contained by such package. Regardless of the dimensions of the package, however, in each embodiment it is important that the openings be provided at a distance from the end closure so as to assure that the openings are contained within the underlying gusset portions when the package is loaded with material.

[0034] The vented package of the invention is not restricted to containing cotton, and may be employed to contain a variety of materials such as natural or synthetic fibers, and other bale products.

[0035] It will be understood that the above described embodiments of the invention may assume a variety of different shapes, sizes and configurations without departing from the scope of the present invention.

[0036] It will be understood that the above described embodiments of the invention are illustrative in nature, and that modifications thereof may occur to those skilled in the art. Accordingly, this invention is not to be regarded as limited to the embodiments or particular uses disclosed herein, but are to be limited only as defined in the appended claims.